

5 for the purpose of this disclosure, changes in the construction and arrangement of parts and the performance of steps can be made by those skilled in the art, which changes are encompassed within the spirit of this invention as defined by the appended claims.

10 What is claimed is:

1. A control communication method for a satellite communication system having a central earth station and a plurality of remote earth stations linked to the central earth station through at least one satellite in orbit above the earth, the method comprising:

15 synchronizing a timing in the central earth station and the plurality of remote earth stations such that a predetermined control time period having a plurality of distinct sequential time slots is synchronized among the central earth station and the remote earth stations;

20 initiating from a respective remote earth station, and completing, a transmission of control information through the satellite to the central earth station only during a respective one or more of the time slots assigned to the respective remote earth station;

25 receiving the transmission at the central earth station; and

5 sending from the central earth station, in
response to the received transmission, a separate
transmission of data through the satellite to the remote
earth station.

10 2. A method as defined in claim 1, wherein
synchronizing includes receiving in the central earth
station and each remote earth station a timing signal from
a source other than the central earth station and the
remote earth stations.

15 3. A method as defined in claim 1, wherein
synchronizing includes receiving in the central earth
station and each remote earth station a timing signal from
the Global Positioning System.

20 4. A method as defined in claim 1, further
comprising:

25 determining a substantially real-time response
time period for the respective central earth station and
remote earth stations, wherein the control time period is
not longer than the substantially real-time response time
period; and

 determining the number of time slots that can be
assigned to remote earth stations for the control time
period that is not longer than the determined substantially
real-time response time period.

5 5. A method as defined in claim 4, further
comprising allocating the remote earth stations among a
plurality of transmission frequencies when there are more
remote earth stations than the number of determined time
slots for the control time period, wherein an allocated
10 frequency is used by the respective allocated remote earth
stations in initiating and completing a respective
transmission of control information through the satellite
to the central earth station during the respective one or
more of the assigned time slots of the control time period
such that transmissions of control information from
15 different remote earth stations can occur simultaneously.

6. A method as defined in claim 1, further
comprising obtaining from the Internet the data to be sent
from the central earth station.

20 7. A method as defined in claim 1, further
comprising obtaining the data from an information resource
containing high bandwidth digitally encoded or compressed
information.

8. A method as defined in claim 7, further
25 comprising sending from the remote earth station to the
central earth station a separate transmission of high
bandwidth digitally encoded or compressed information.

5 9. A method as defined in claim 1, further comprising sending from the remote earth station a transmission of data distinct from the control information and through a different communication channel than used for the transmission of control information.

10 10. A method as defined in claim 1, wherein initiating and completing a transmission of control information includes sending an alarm indication to the central earth station.

15 11. A method as defined in claim 10, further comprising communicating, from the central earth station, a message over the Internet in response to the alarm indication.

20 12. A method as defined in claim 1, further comprising detecting at a respective remote earth station a real-time event and including real-time event information in the control information.

25 13. A method as defined in claim 12, further comprising communicating, from the central earth station, a message over the Internet in response to the real-time event information.

 14. A method of providing information to remote locations, comprising:

5 defining a satellite communication group having a central earth station, a plurality of remote earth stations each at a respective location remote from the central earth station, and a satellite in orbit above the earth, wherein the satellite has a predetermined communication bandwidth;

10 assigning a cyclical control communication time period to the defined satellite communication group, wherein the control communication time period is not longer than a substantially real-time response time period for any one of the remote earth stations in the defined satellite communication group;

15 determining a transmission time having a duration sufficient for a transmission to be sent from any of the remote earth stations and received by the central earth station;

20 allocating a specific number of time slots within the control communication time period in response to the duration of the control communication time period and the determined transmission time;

25 determining the number of remote earth stations in the defined satellite communication group and the number of time slots;

assigning each remote earth station to at least one respective time slot and to a common control

5 transmission frequency if there are not more remote earth stations than time slots;

if there are more remote earth stations than time slots, assigning a remote earth station to at least one respective time slot and continuing such assigning for
10 other remote earth stations until the time slots are all allocated and assigned a first common control transmission frequency to these assigned remote earth stations, and allocating other remote earth stations to respective time slots but at a second common control transmission frequency
15 and repeating the same for additional remote earth stations and respective common control transmission frequencies until all the remote earth stations are assigned at least one respective time slot and common control transmission frequency;

20 time synchronizing the central earth station and the plurality of remote earth stations such that the cyclical control communication time period is synchronized among the central earth station and the remote earth stations;

25 initiating from a respective remote earth station, and completing, a transmission of control information through the satellite to the central earth station only during a respective one or more of the time

5 slots of the cyclical control communication time period
assigned to the respective remote earth station;

receiving the transmission at the central earth
station; and

10 sending from the central earth station, in
response to the received transmission, a separate
transmission of data through the satellite to the
respective remote earth station.

15 15. A method as defined in claim 14, wherein the time
synchronizing occurs in response to a timing signal
transmitted from a source other than the central earth
station and the remote earth stations.

16. A method as defined in claim 15, further
comprising obtaining from the Internet the data to be sent
from the central earth station.

20 17. A method as defined in claim 15, further
comprising obtaining data, for sending from the central
earth station, from an information resource containing high
bandwidth information:

25 18. A method as defined in claim 14, wherein the time
synchronizing occurs in response to a timing signal
transmitted to each of the central earth station and the
remote earth stations from the Global Positioning System.

5 19. A method as defined in claim 18, further
comprising obtaining from the Internet the data to be sent
from the central earth station.

10 20. A method as defined in claim 18, further
comprising obtaining the data from an information resource
containing high bandwidth information.

21. A method as defined in claim 14, further
comprising obtaining from the Internet data to be sent from
the central earth station.

15 22.. A method as defined in claim 14, further
comprising obtaining the data from an information resource
containing high bandwidth information.

20 23. A method as defined in claim 22, further
comprising sending from a respective one of the remote
earth stations to the central earth station a separate
transmission of high bandwidth information.

25 24. A method as defined in claim 14, further
comprising sending from a respective remote earth station a
transmission of data distinct from the transmission of
control information and through a different communication
channel than used for the transmission of control
information.

25. A method as defined in claim 14, wherein
initiating and completing a transmission of control

5 information includes sending an alarm indication to the
central earth station.

26. A method as defined in claim 25, further
comprising communicating, from the central earth station, a
message over the Internet in response to the alarm
10 indication.

27. A method as defined in claim 14, further
comprising detecting at a respective remote earth station a
real-time event and including real-time event information
in the control information.

28. A method as defined in claim 27, further
comprising communicating, from the central earth station, a
message over the Internet in response to the real-time
event information.

29. A satellite communication system providing real-
20 time acquisition and transmission of high bandwidth data,
comprising:

an information resource providing a high
bandwidth transmission;

a satellite;

25 a central earth station;

a remote earth station in communication with the
central earth station through the satellite to transmit
control information on a first transmission path through

5 the satellite only during a predetermined periodic time slot assigned to the remote earth station; and

wherein the central earth station is connected to the information resource to receive the high bandwidth transmission and to communicate the high bandwidth
10 transmission on a second transmission path through the satellite to the remote earth station in response to the control information transmitted by the remote earth station.

30. A satellite communication system as defined in
15 claim 17, wherein the information resource includes the ~~Internet~~.

31. A satellite communication system as defined in claim 29, wherein the remote earth station is adapted to communicate information to the central earth station on a
20 transmission path different from the first transmission path.

32. A satellite transmission system as defined in claim 29, wherein the central earth station is adapted to send via the Internet information responsive to real-
25 time event information received by the central earth station from the remote earth station.